

### ABSTRACT OF THE DISCLOSURE

An induction heating system and method of using the same are described. The system includes a locator system that eccentrically positions the central axis of the internal central void of the work piece with respect to the central axis of the locator system. The locator system also includes a rotation system that allows the work piece to be eccentrically rotated during the heat-treating process. In this manner, the lobe and heel portions of a cammed surface are substantially equidistant from the internal surfaces of an inductor so as to ensure substantially uniform heating of the external surfaces of the work piece.